



# The European offshore wind industry - key trends and statistics 2014

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# Executive summary

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## Offshore wind power market in 2014

- 408 new offshore wind turbines in nine wind farms and one demonstration project, worth between €4.2 billion and €5.9 billion, were fully grid connected between 1 January and 31 December 2014. The new capacity totals 1,483.3 MW - 5.34% less than in 2013;
  - 536 turbines were erected during 2014, an average of 5.9 MW per day. 373 of these turbines are awaiting grid connection;
  - Work is on-going on 12 projects.
- 

## Cumulative offshore wind power market

- 2,488 turbines are now installed and grid connected, making a cumulative total of 8,045.3 MW in 74 wind farms in 11 European countries;
  - 78.8% of substructures are monopiles, 10.4% are gravity foundations, jackets account for 4.7%, tripods account for 4.1%, and tripiles account for 1.9%;
  - There are also two full-scale grid-connected floating turbines.
- 

## Market outlook for 2015 and 2016

- Once completed, the 12 offshore projects currently under construction will increase installed capacity by a further 2.9 GW, bringing the cumulative capacity in Europe to 10.9 GW.
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## Trends: turbines, foundations, water depth and distance to shore

- The average offshore wind turbine size was 3.7 MW, slightly less than in 2013 due to the increased proportion of installation of the Siemens 3.6 MW wind turbines;
  - The average size of a grid-connected offshore wind farm in 2014 was 368 MW, 24.1% less than the previous year. This is the result of the 2013 completion of the record breaking London Array (630 MW);
  - The average water depth of wind farms completed, or partially completed, in 2014 was 22.4 metres (m) and the average distance to shore was 32.9 km.
- 

## Financing highlights and developments

- Project finance is increasingly becoming an important tool in financing offshore wind. The industry raised €3.14 billion of non-recourse debt in 2014 – the highest ever level reached in the industry;
  - Nearly half of the final investment decisions made in 2014 were billion-euro projects, in total 2,323 MW of new gross capacity was financed;
  - Partnerships are becoming a key to success, and as liquidity is back in the financial markets, developers will be more likely to align their interests with those of potential investors.
-

# Annual market in 2014

## Offshore wind installations

During 2014, work was carried out on 17 offshore wind farms in Europe.

- Four utility-scale wind farms were completed. One demonstration project (Methil) also went online;
- Work continued in five other wind farms where several wind turbines were erected and connected;
- Work has started but no turbines are yet connected in seven other wind farms.

TABLE 1: SUMMARY OF WORK CARRIED OUT AT EUROPEAN OFFSHORE WIND FARMS DURING 2014

Wind farm name	Country	Status
Meerwind Sud/Ost	Germany	Fully grid connected
Methil Demo (Energy Park Fife)	United Kingdom	Fully grid connected
Northwind	Belgium	Fully grid connected
Riffgat	Germany	Fully grid connected
West of Duddon Sands	United Kingdom	Fully grid connected
Dan Tysk	Germany	Partially completed
Global Tech 1	Germany	Partially completed
Gwynt y Môr	United Kingdom	Partially completed
Nordsee Ost	Germany	Partially completed
Westermost Rough	United Kingdom	Partially completed
Baltic 2	Germany	Turbines installed
Borkum Riffgrund I	Germany	Turbines installed
Butendiek	Germany	Turbines installed
Humber Gateway	United Kingdom	Turbines installed
Trianel Windpark Borkum	Germany	Turbines installed
Amrumbank West	Germany	Foundations installed
Luchterduinen	Netherlands	Foundations installed

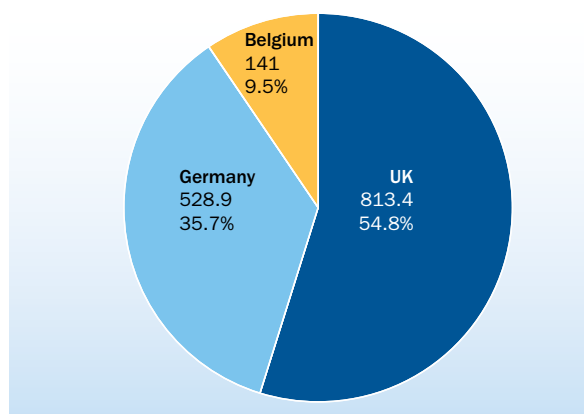


FIG 1: SHARE OF ANNUAL OFFSHORE WIND CAPACITY INSTALLATIONS PER COUNTRY (MW)

TABLE 2: NUMBER OF TURBINES AND MW FULLY CONNECTED TO THE GRID DURING 2014 PER COUNTRY (MW)

Country	Belgium	Germany	UK
No. of farms	1	5	4
No. of turbines connected	47	142	219
MW connected to the grid	141	528.9	813.4

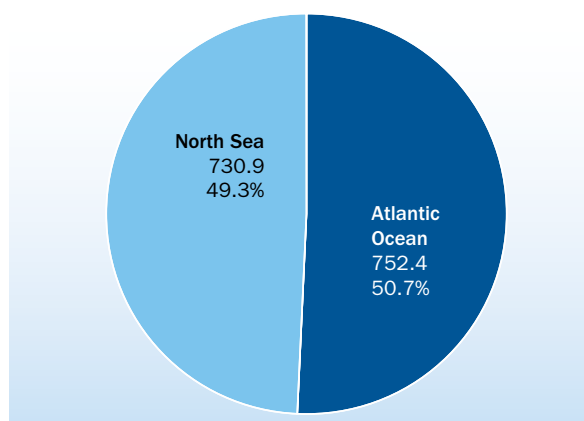


FIG 2: SEA BASIN SHARE OF 2014 ANNUAL INSTALLATIONS (MW)

Of the total 1,483.3 MW connected in European waters, 50.7% were in the Atlantic Ocean, and 49.3% were located in the North Sea.

## Annual market share in 2014 - wind turbine manufacturers

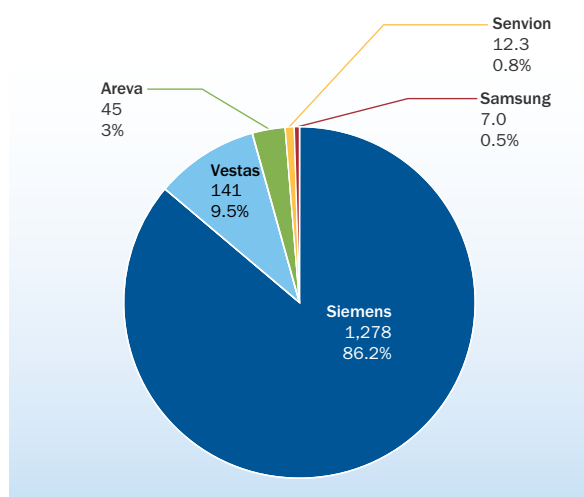


FIG 3: WIND TURBINE MANUFACTURERS' SHARE OF 2014 ANNUAL INSTALLATIONS (MW)

Siemens continues to be the top offshore wind turbine supplier in terms of annual installations. With 1,278 MW of new capacity connected, Siemens accounts for 86.2% of the market. Vestas (141 MW, 9.5%), Areva (45 MW, 3%) and Senvion (12.3 MW, 0.8%) are the other turbine manufacturers who had turbines grid connected in full-scale wind farms during 2014. Samsung connected its demonstration turbine to the grid in Fife, UK (7 MW, 0.5%).

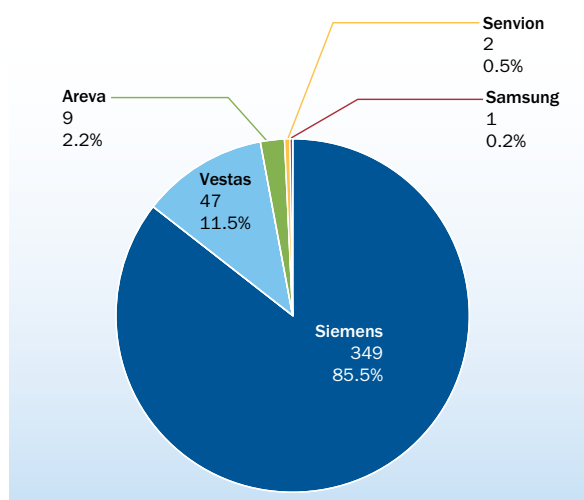


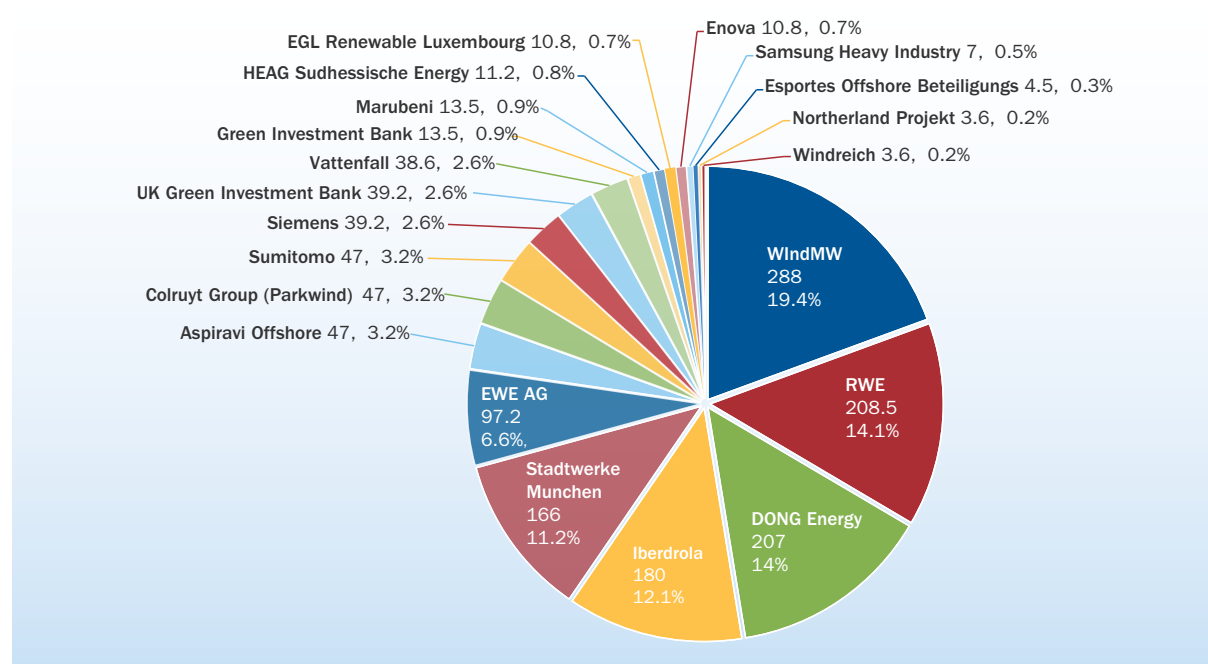
FIG 4: WIND TURBINE MANUFACTURERS' SHARE OF 2014 ANNUAL INSTALLATIONS IN TERMS OF UNITS CONNECTED

Similarly, in terms of units connected, Siemens remains at the top with 340 3.6 MW turbines and nine 6 MW off-shore wind turbines (85.5% of connected wind turbines) connected in European waters during 2014. Siemens is followed by Vestas which connected 47 3 MW turbines (11.5%), Areva (nine turbines of 5 MW, 2.2%) and Senvion (two turbines of 6.15 MW, 0.5%). Samsung, connected one demonstration turbine of 7 MW.

## Annual market share in 2014 - wind farm developers/owners<sup>2</sup>

FIG 5: DEVELOPERS' SHARE OF 2014 ANNUAL INSTALLATIONS (MW)

WindMW was the largest developer in the European off-shore sector in 2014 with 19.4% of total connections. Combined with RWE (14.1%), DONG Energy (14%), Iberdrola (12.1%) and Stadtwerke Munchen (11.2%), the top five developers added 70.8% of the capacity that went online during 2014.



<sup>2</sup> The grid-connected market shares are indicative only. Projects owned or developed by several companies have been split according to the respective shares. Where the shares are not known, they have been split in equal parts between the partners.

## Annual market share in 2014 - substructures

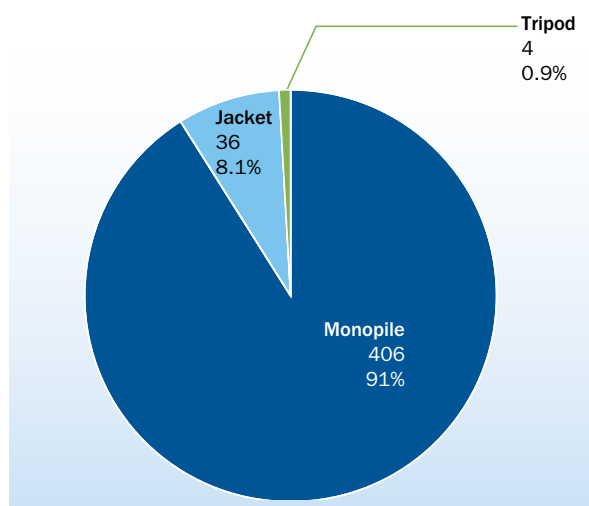


FIG 6: FOUNDATION TYPES' SHARE OF 2014 ANNUAL MARKET IN TERMS OF UNITS

Monopile substructures remained the most popular substructure type in 2014 with 406 installed (91%). 36 jacket foundations were also installed, representing 8.1% of all newly installed substructures, followed by tripods (0.9%).

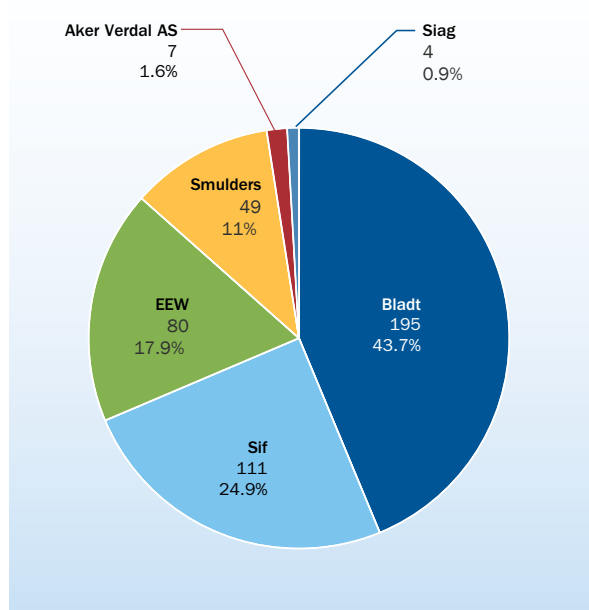


FIG 7: SHARE OF FOUNDATIONS INSTALLED IN 2014 BY MANUFACTURING COMPANY<sup>3</sup> IN TERMS OF UNITS

Foundations installed in 2014 were supplied by six companies: Bladt (195 foundations, 43.7%) followed by Sif (111 foundations, 24.9%), EEW (80 foundations, 17.9%), Smulders (49 foundations, 11%) Aker Verdal (seven foundations, 1.6%) and Siag (four foundations, 0.9%).

<sup>3</sup> The shares are calculated according to the actual number of individual foundations installed in 2014. When the project developer contracted more than one company to manufacture the foundations and respective roles and shares (in case of consortia or joint ventures) were not specified, foundations installed were split in equal parts between the partners.

## Annual market share in 2014 - cables

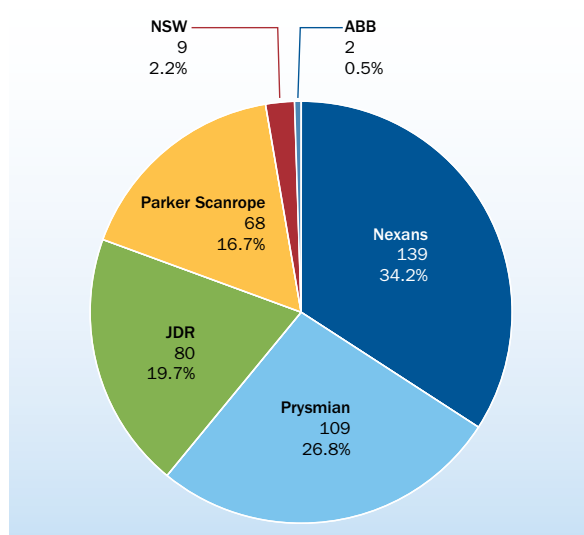


FIG 8: SHARE OF INTER-ARRAY CABLE SUPPLIERS TO OFFSHORE WIND FARMS IN 2014 (NO. OF CABLES)<sup>4</sup>

In 2014, 139 inter-array cables manufactured by Nexans were energised, representing the largest market share at 34.2%. 109 cables connecting wind turbines manufactured by Prysmian were energised, representing 26.8% of all energised cables. 80 cables manufactured by JDR were also energised (19.7%), together with 68 by Parker Scanrope (16.7%), nine by NSW (2.2%) and two by ABB (0.5%)<sup>5</sup>.

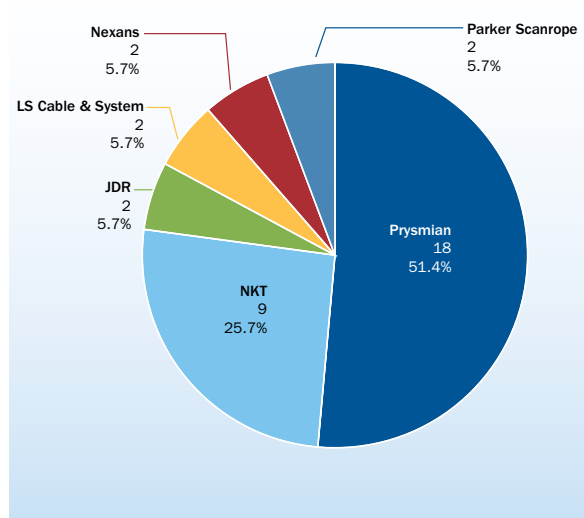


FIG 9: SHARE OF EXPORT CABLE SUPPLIERS IN 2014 (NO. OF CABLES, PERCENTAGE)

In terms of export cables, in 2014 18 export cables manufactured by Prysmian were energised (51.4% of all export cables) alongside nine export cables manufactured by NKT (25.7%). JDR, LS Cable & System, Nexans and Parker Scanrope each supplied two cables (5.7%) that were energised in 2014<sup>6</sup>.

<sup>4</sup> The shares are calculated taking into account the number of turbines grid connected in each wind farm during 2014.

<sup>5</sup> The Energy Park Fife demonstration project is not included in this calculation.

<sup>6</sup> The shares are calculated by taking into account the number of export cables in wind farms fully completed or partially completed.

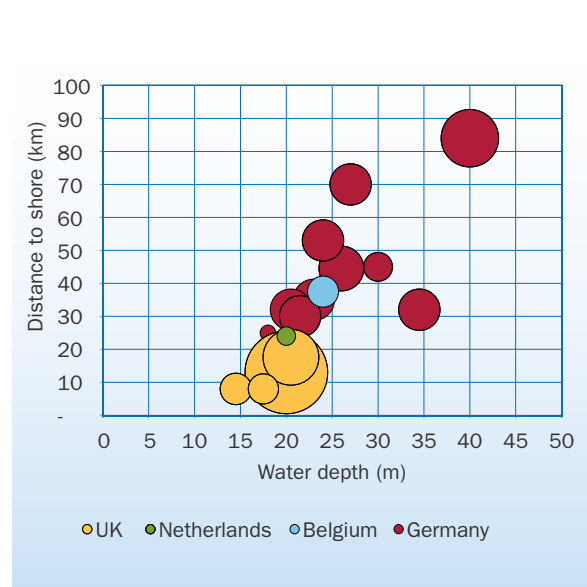


## Wind turbine capacity and wind farm size

The average capacity rating of the 408 offshore wind turbines connected to the grid in 2014 was 3.7 MW, smaller than in 2013. The popularity of Siemens' 3.6 MW turbine (340 wind turbines connected in 2014) keeps the average turbine size near the 4 MW mark, despite the emergence and installation of larger rated turbines.

The average capacity size of the nine utility scale wind farms connected to the grid during 2014 was 368 MW, a 24.1% decrease from 2013.

## Water depth and distance to shore



## Cumulative market

A total of 2,488 wind turbines are now installed and connected to the electricity grid in 74 offshore wind farms in eleven countries across Europe. Total installed capacity at the end of 2014 reached 8,045.3 MW, producing 29.6 TWh in a normal wind year, enough to cover 1% of the EU's total electricity consumption<sup>7</sup>.

FIG 11: CUMULATIVE AND ANNUAL OFFSHORE WIND INSTALLATIONS (MW)

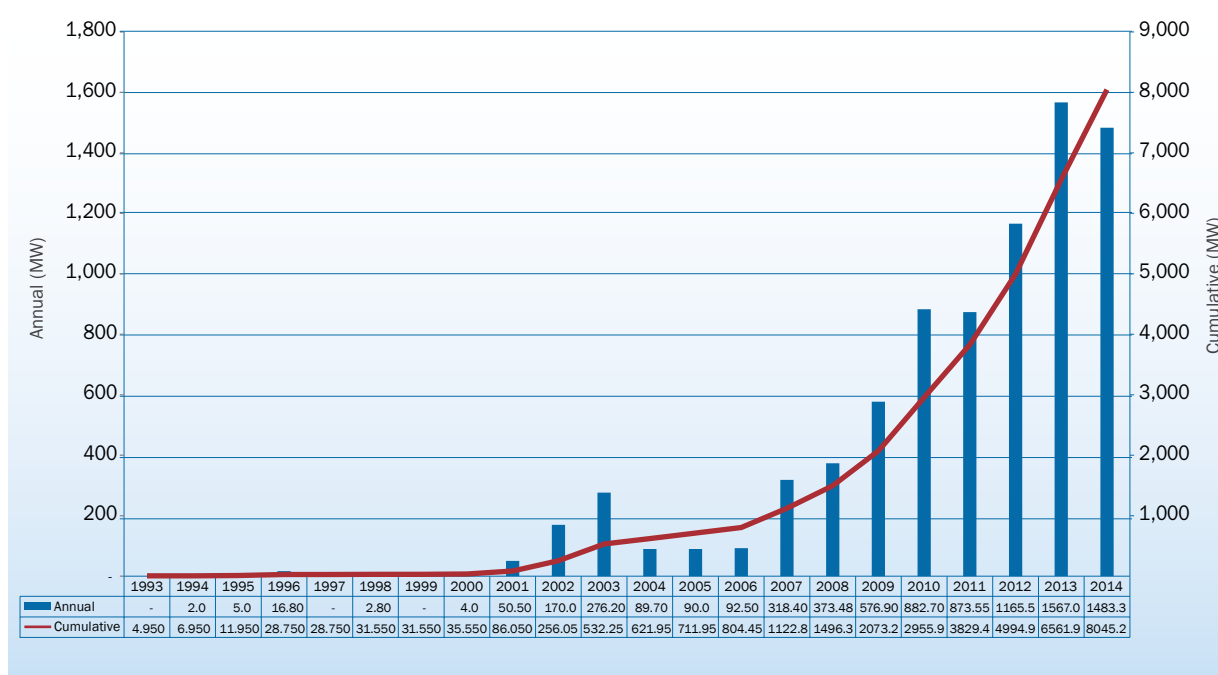


TABLE 3: NUMBER OF WIND FARMS, NO. OF TURBINES CONNECTED AND NO. OF MW FULLY CONNECTED TO THE GRID AT THE END OF 2014 PER COUNTRY.

Country	BE	DE	DK	ES	FI	IE	NL	NO	PT	SE	UK	Total
No. of farms	5	16	12	1	2	1	5	1	1	6	24	74
No. of turbines	182	258	513	1	9	7	124	1	1	91	1,301	2,488
Capacity installed (MW)	712	1,048.9	1,271	5	26	25	247	2	2	212	4,494.4	8,045.3

The UK has the largest amount of installed offshore wind capacity in Europe (4,494.4 MW) - 55.9% of all installations. Denmark follows with 1,271 MW (15.8%). With 1,048.9 MW (13% of total European installations), Germany is third, followed by Belgium (712 MW: 8.8%), the Netherlands (247 MW: 3.1%), Sweden (212 MW: 2.6%), Finland (26 MW: 0.3%), Ireland (25 MW), Spain (5 MW), Norway (2 MW) and Portugal (2 MW).

<sup>7</sup> The most recent data (2012) for EU 28 final energy consumption of electricity from EUROSTAT is 2,798 TWh. Eurostat, online table code [nrg\_105a], extracted on 21 January 2015.

FIG. 12: INSTALLED CAPACITY - CUMULATIVE SHARE BY COUNTRY (MW)

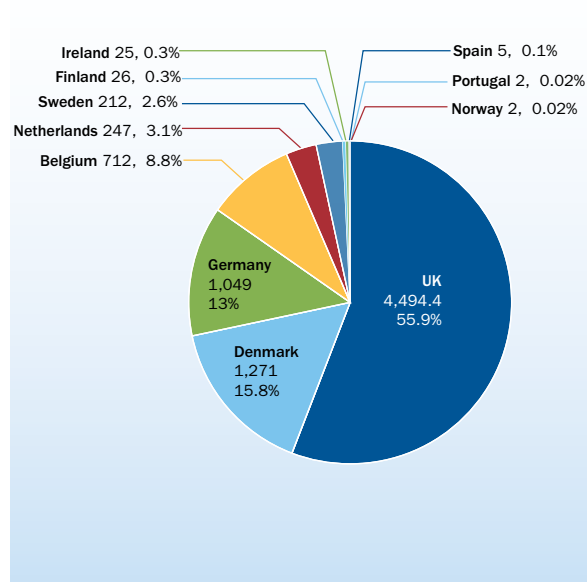


FIG. 13: INSTALLED WIND TURBINES - CUMULATIVE SHARE BY COUNTRY (NO. OF UNITS)

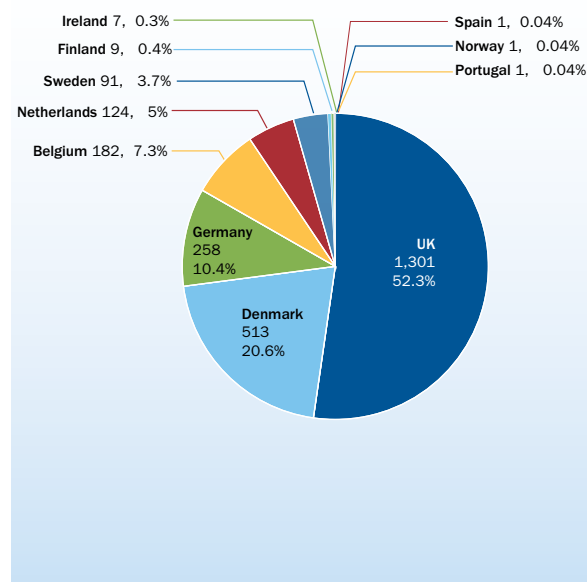
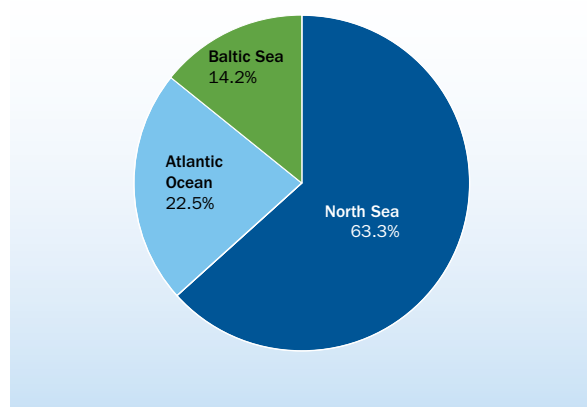


FIG. 14: INSTALLED CAPACITY, CUMULATIVE SHARE BY SEA BASIN (MW)



In terms of the number of wind turbines in Europe, the UK leads the market with 1,301 turbines (52.3%), followed by Denmark (513 wind turbines: 20.6%), Germany (258 turbines: 10.4%), Belgium (182 turbines: 7.3%), the Netherlands (124 turbines: 5%), Sweden (91 turbines: 3.7%), Finland (nine turbines: 0.4%) and Ireland (seven turbines). Norway, Portugal, and Spain all have one wind turbine each.

The 8,045.3 MW of offshore wind capacity are mainly installed in the North Sea (5,094.2 MW: 63.3%). 1,808.6 MW or 22.5% are installed in the Atlantic Ocean and 1,142.5 MW (14.2%) in the Baltic Sea.

## Cumulative market share: wind turbine manufacturers

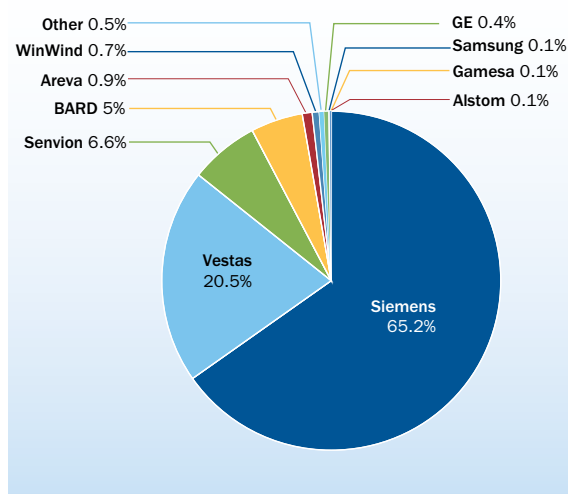


FIG. 15: WIND TURBINE MANUFACTURERS' SHARE AT THE END OF 2014 (MW)

Siemens is the lead offshore wind turbine supplier in Europe with 65.2% of total installed capacity. Vestas (20.5%) is the second biggest turbine supplier, followed by Servion (6.6%), BARD (5%), Areva (0.9%), WinWind (0.7%) and GE (0.4%). Other suppliers including Samsung, Alstom and Gamesa together account for 0.8% of the market.

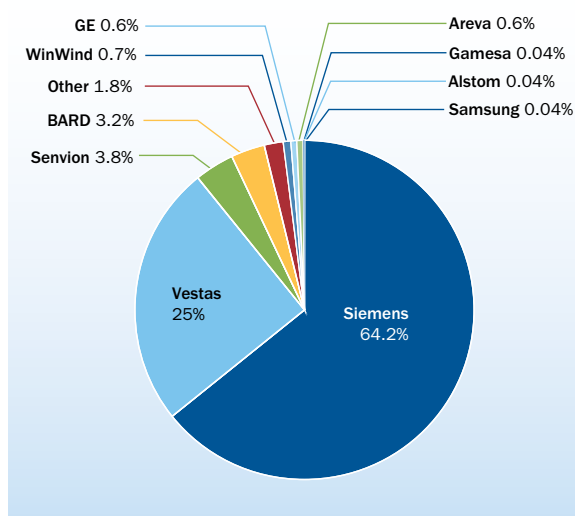
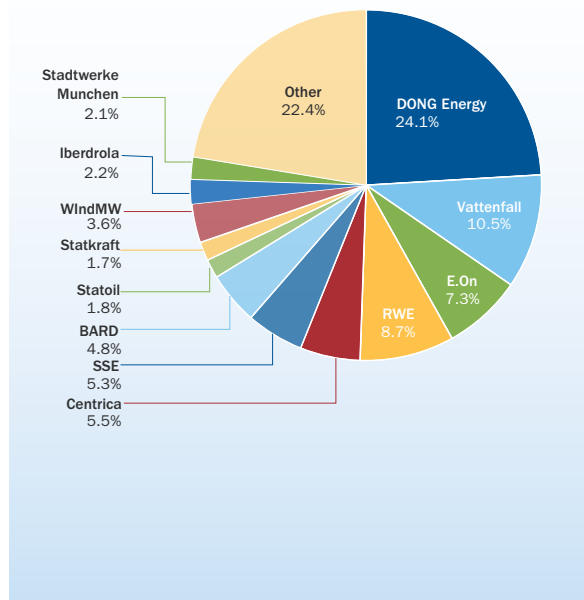


FIG. 16: WIND TURBINE MANUFACTURERS' SHARE AT THE END OF 2014 (TURBINES INSTALLED)

In terms of the total number of wind turbines installed at the end of 2014, Siemens remains the top supplier with 1,598 turbines, accounting for 64.2% of the whole market. Vestas has installed and grid connected 621 turbines representing 25% of total turbines, followed by Servion (94 turbines: 3.8%), BARD (80 turbines: 3.2%), and WinWind with 18 wind turbines (0.7%). GE, Areva, Gamesa, Alstom and Samsung together account for 1.3% of the connected capacity.

## Cumulative market share: wind turbine developers/owners

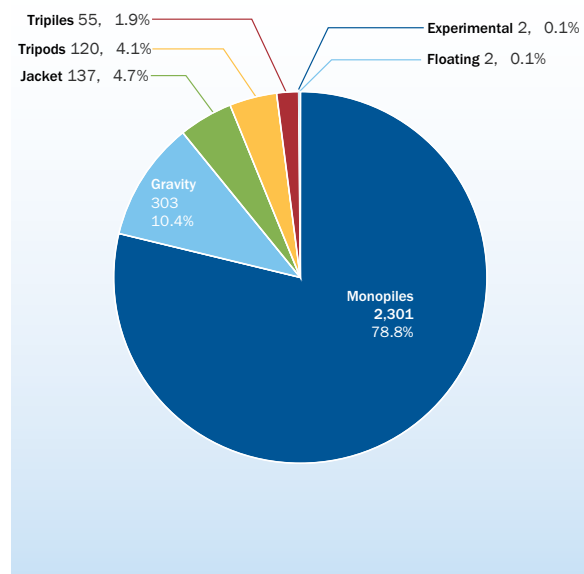
FIG. 17: OWNERS SHARE OF INSTALLED CAPACITY<sup>8</sup>



DONG Energy maintains its position as the biggest owner of offshore wind power in Europe with 24.1% of cumulative installations at the end of 2014. Vattenfall (10.5%) and E.ON (7.3%), also maintain their position within the top three. RWE followed with 8.7%, of cumulative installations, Centrica with 5.5%, SSE (5.3%), and BARD (4.8%).

## Substructures

FIG. 18: SHARE OF SUBSTRUCTURE TYPES FOR ONLINE WIND TURBINES END 2014 (MW)

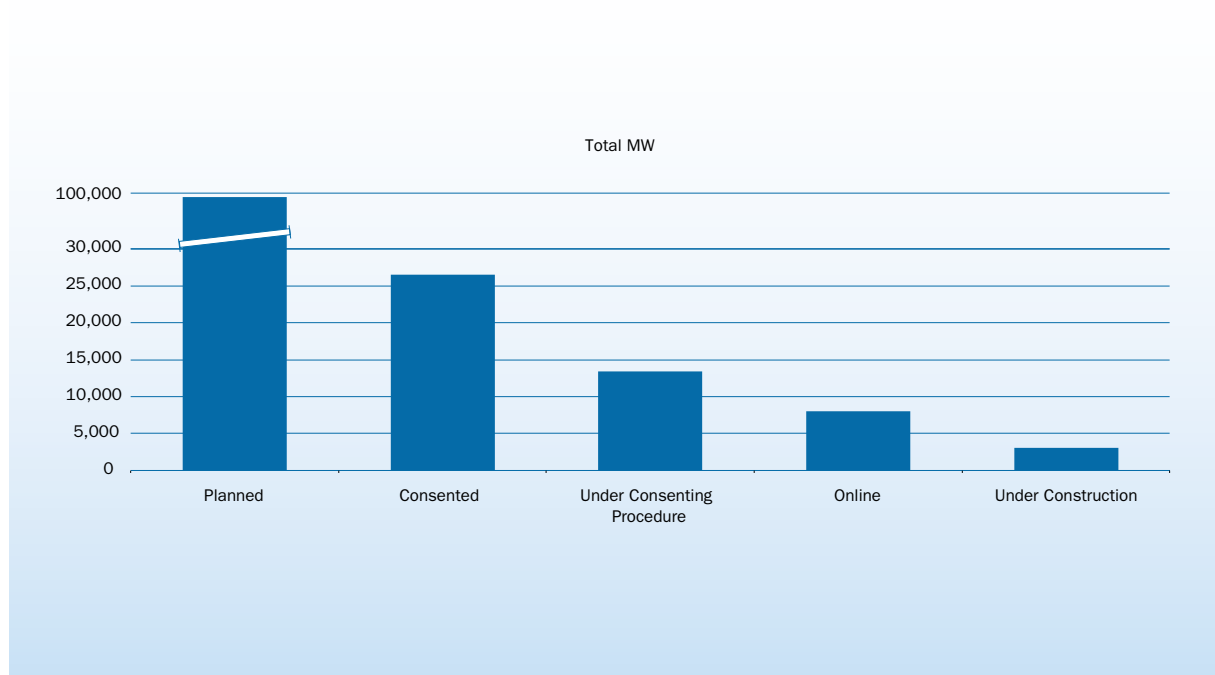


There were 2,920 substructures fully installed in European offshore wind farms at the end of 2014. The most common substructures used were monopiles: 2,301 monopiles were installed at the end of 2014 (78.8% of all installed foundations). Gravity based foundations were the second most common with 303 units installed (10.4%), followed by jacket foundations (137 units: 4.7%), tripods (120 units: 4.1%) and tripiles (55 units: 1.9%). Two full scale floating structures were still in the water in 2014.

<sup>8</sup> Market shares are indicative only. Projects owned or developed by several companies have been split according to the respective shares. Where the shares are not known, they have been split in equal parts between the partners.

## Market outlook for 2015 and 2016

FIG. 19: OFFSHORE MARKET: PROJECTS PLANNED, CONSENTED, UNDER CONSENTING PROCEDURE, ONLINE AND UNDER CONSTRUCTION



The market outlook for 2015 remains stable in terms of capacity to be brought online. There are twelve projects under construction - representing 2.9 GW - in the pipeline for the next 12 to 18 months. Five of these projects had some wind turbines connected to the grid in 2014; once completed they will result in a further 1.18 GW of capacity taking the cumulative offshore wind capacity to a minimum of 9.2 GW in Europe. However, predictions of reaching 10 GW by 2015 are well within industry expectations.

2015 will see Germany overtake the UK in annual grid connected capacity. The largest wind farms to be fully completed will be RWE's Gwynt y Mor (576 MW) followed by Global Tech 1 (400 MW), both expected in Q1.

2016 however will see a slump in the market, featuring a low level of wind turbines being connected. The UK is unlikely to fully commission any hundred-MW scale offshore wind farms, though the 50 MW Kentish Flats Extension may be started and commissioned. Outside of the UK, only Germany and the Netherlands are expected to bring capacity online in 2016 with DONG Energy's Gode Wind 1 and 2 and ENECO's Westermeerwind.

Further in the future, EWEA has identified 26.4 GW of consented offshore wind farms in Europe and future plans for offshore wind farms totalling more than 98 GW.

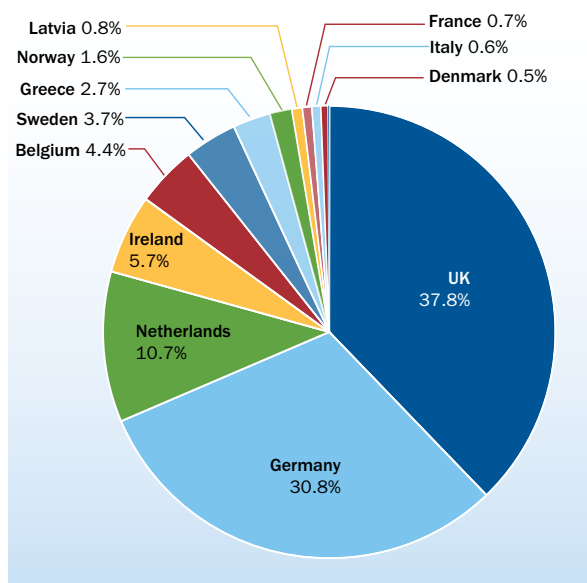


FIG. 20: SHARE OF CONSENTED OFFSHORE CAPACITY PER COUNTRY (MW)

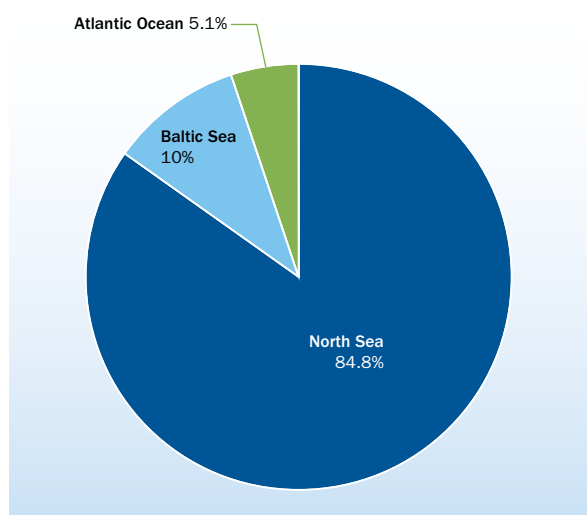


FIG. 21: SHARE OF OFFSHORE WIND FARMS UNDER CONSTRUCTION BY SEA BASIN (MW)

When looking at wind farms currently under construction per sea basin, it is clear that the North Sea will continue to be the main region for offshore deployment (84.8% of total capacity under construction). The Baltic Sea (10%) and the Atlantic Ocean (5.1%) will, however, continue to attract important developments. No significant developments are expected in the Mediterranean Sea in the short term.

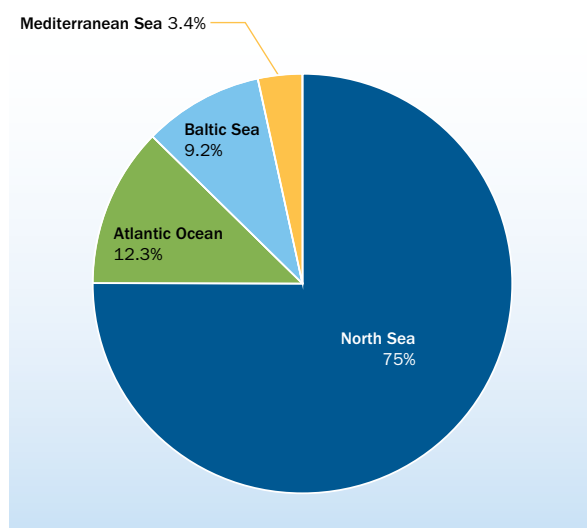


FIG. 22: SHARE OF CONSENTED OFFSHORE WIND FARMS BY SEA BASIN (MW)

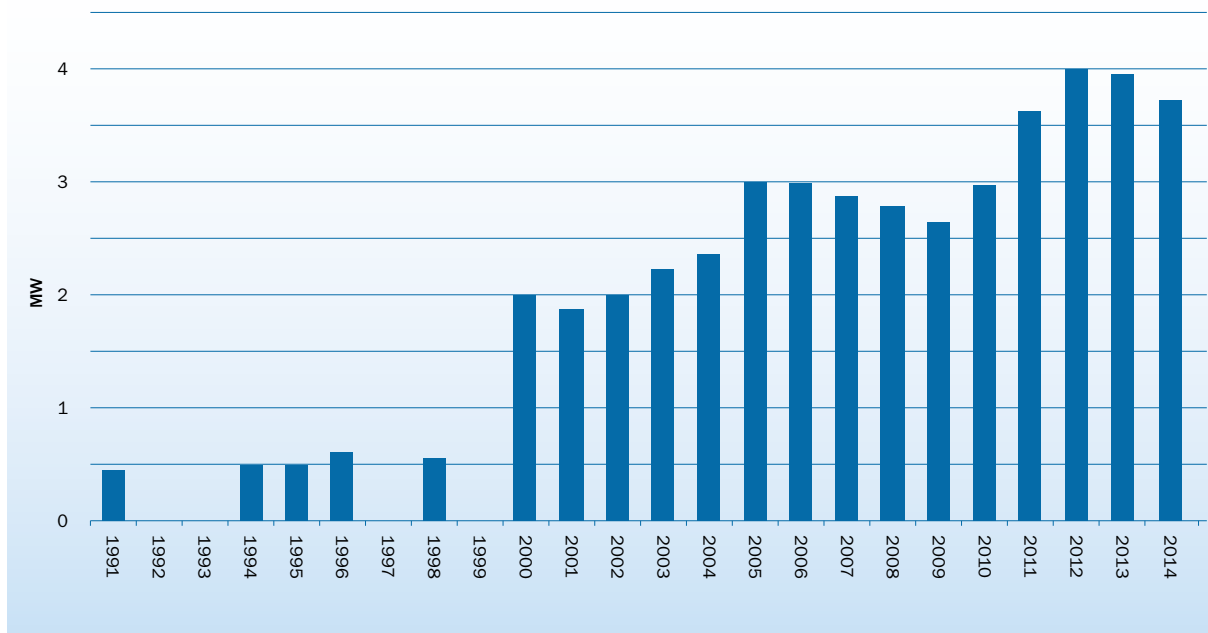
In the medium term, an analysis of consented wind farms confirms that the North Sea will remain the main region for offshore deployment (75% of total consented capacity) with significant developments also foreseen in the Atlantic Ocean (12.3% of consented capacity) and in the Baltic Sea (9.2%). The Mediterranean could begin exploiting its offshore potential (3.4% of consented capacity).

## Trends: turbines, water depth and distance to shore

### Wind turbine capacity

Since 1991 the average size of wind turbines installed in European waters has increased significantly. During 2014, the average capacity of new wind turbines installed was 3.7 MW, slightly less than the previous year due to the increased proportion of installation of the Siemens 3.6 MW wind turbine. Considering the wind farms currently under construction, it is expected that average turbine capacity will remain stable in 2015.

FIG. 23: AVERAGE OFFSHORE WIND TURBINE RATED CAPACITY

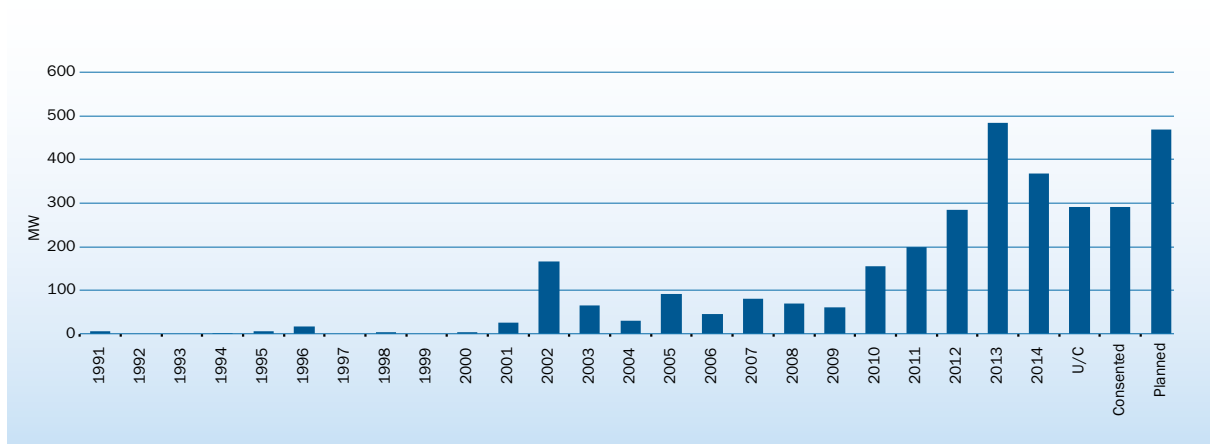




## Wind farm size

In 2012, the average size of connected offshore wind projects was 286 MW while in 2013 it was 485 MW. In 2014, it was 368 MW. This is the result of the completion in 2013 of the record breaking London Array (630 MW).

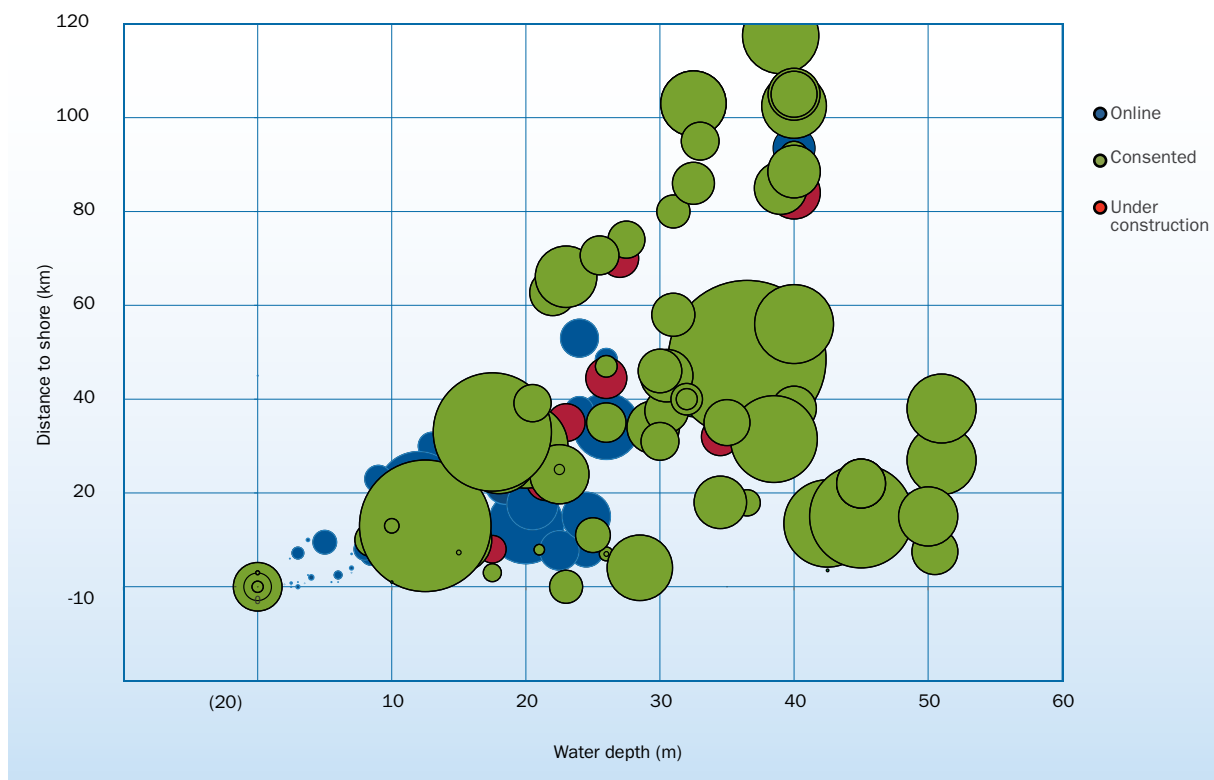
FIG. 24: AVERAGE SIZE OF OFFSHORE WIND FARM PROJECTS



## Water depth and distance to shore

Over the years, offshore wind farms have moved further from shore and into deeper waters. At the end of 2014, the average water depth of online wind farms was 22.4 m and the average distance to shore 32.9 km. Projects under construction, consented and planned confirm that average water depths and distances to shore are likely to increase.

FIG. 25: AVERAGE WATER DEPTH AND DISTANCE TO SHORE OF ONLINE, UNDER CONSTRUCTION AND CONSENTED WIND FARMS



# Financing

## Financing highlights and developments in 2014

2014 was a year of positive developments in financing offshore wind. Successful projects were able to attract both investors and lenders, reflecting a strong return of liquidity in the markets and an increased appetite

for credit in the infrastructure zone. Nearly half of the final investment decisions in 2014 were billion-Euro projects.

## 2014 in numbers

9 new projects that reached the final investment decision stage of which 4 were “billion-Euro” projects.

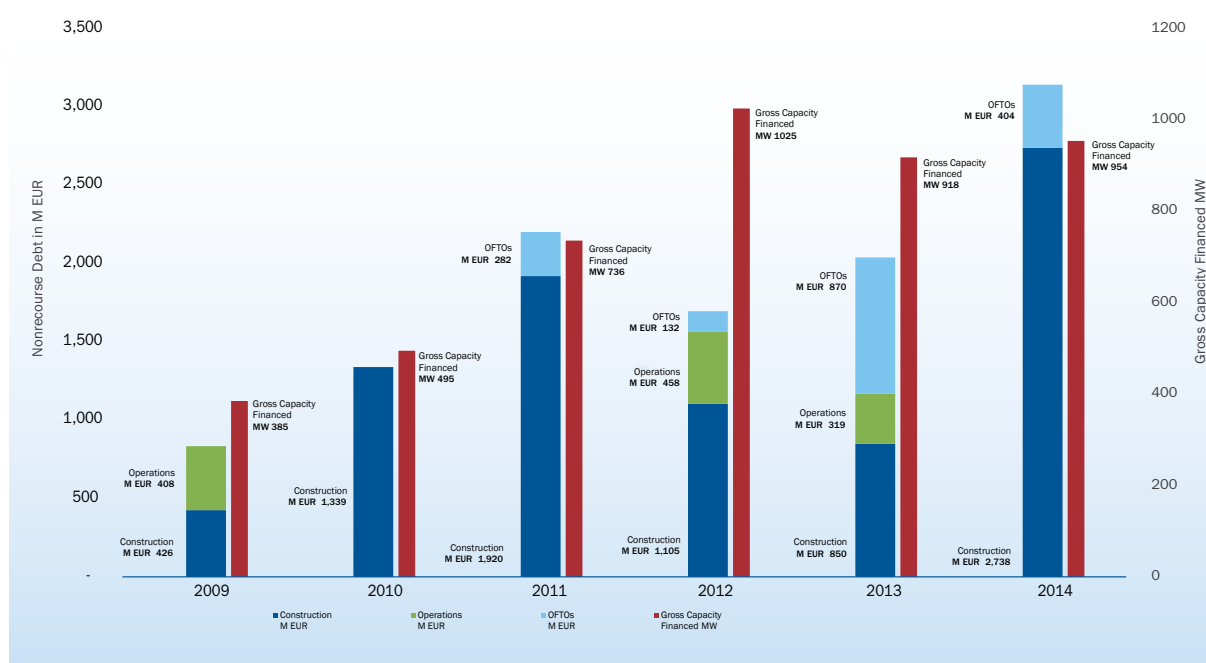
2,323 MW of new gross capacity financed, of which 954 MW financed on a non-recourse basis.

## Non-recourse debt<sup>9</sup>

Project finance remained an important tool for funding 41% of the new gross capacity that reached a final investment decision in 2014. Altogether, non-recourse debt for offshore wind reached €3.14 billion in

2014, compared to €2.04 billion in 2013 and €1.7 billion in 2012. Figures include the OFTO<sup>10</sup> activity in the UK, which continues to emerge as an appealing asset class, with long term, inflation-linked revenue.

FIG. 26: NON-RECOURSE DEBT FINANCINGS AND RESPECTIVE GROSS CAPACITY FINANCED



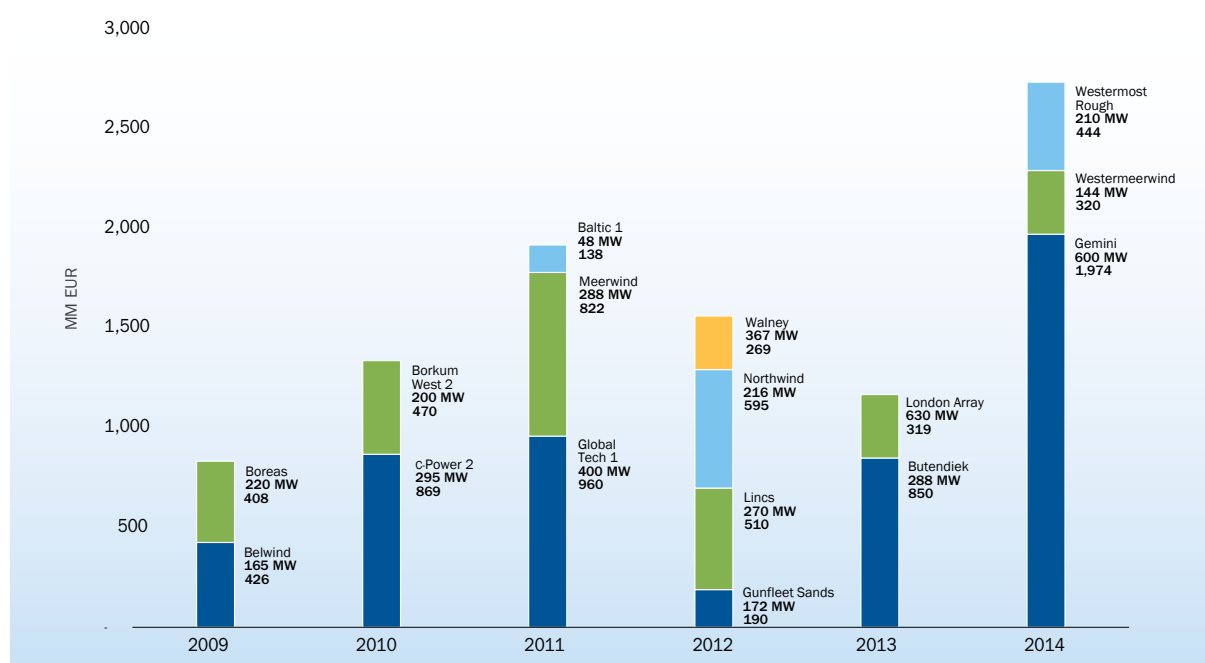
<sup>9</sup> Exchange rate used: 1 GBP = 1.2 EUR; 1 USD = 0.8 EUR.

<sup>10</sup> Offshore Transmission Owners

## Non-recourse debt: transaction highlights

Three non-recourse financings for new projects reached financial close in 2014: the near shore Westermeerwind wind farm, the minority stake financing of Westernmost Rough and the financing of the Gemini wind farm. Their different structures reflect that there is no single model for financing an offshore wind project.

FIG. 27: NON-RECOURSE DEBT LEVELS (MAIN LONG TERM DEBT FACILITY)



### Gemini – deal of the year : 600 MW, €2,099 million<sup>11</sup>

- Gemini was brought to a financial close in May 2014 by a consortium of four sponsors and 16 creditors;
- The participation of Siemens Financial Services (20%), alongside Northland Power (60%), van Oord Dredging and Marine Contractors (10%) and Dutch Utility HVC (10%), brought credibility to the project;
- Senior debt provided by 12 commercial banks proved lenders' appetite to finance offshore construction risk. The transaction simultaneously involved multilaterals like the European Investment Bank (EIB), Export Credit Agencies (ECA) facilities provided by Eksport Kredit Fonden (EKF), Euler Hermes, and Delcredere Ducreire, and mezzanine finance provided NPI and PKA;
- Gemini brought Canadian actors in the European offshore market. Structure wise, its two-contract

model appeared to be welcomed by investors, raising the question of whether this will be a trend-setting project.

### Westermeerwind: 144 MW, €320 million

- The project involves a turnkey agreement, with Siemens developing and operating the project for a minimum of 15 years, and Eneco providing a 15 year PPA agreement;
- The financing of €320 million involves a consortium of Dutch banks with ING and Rabobank as lead arrangers. ASN Bank and Triodos Bank are also providing part of the debt. Guarantee facilities are provided by EKF, confirming the importance and liquidity in the ECA markets;
- The project company is aiming to involve as many local subcontractors as possible, including residents as shareholders or bondholders.

<sup>11</sup> Figure includes ancillary facilities.

**Westermøst Rough: 210 MW, €444 million**

- Marubeni and Green Investment Bank raised £370 million (€444 million) for the refinancing of their 50% stake in the project;
- The project follows a similar pattern to those developed by DONG Energy, with DONG Energy holding a majority stake and making use of balance sheet financing;
- The financing involved five international lenders, three of which were Japanese. It marked the first involvement of Japan Bank for International Cooperation (JBIC), which has also underwritten 47% of the debt tranche.

**Policy driven lenders**

Public and semi-public financial institutions such as the EIB, KfW GIB, and the ECA market players have been present in most notable transactions of 2014.

The EIB alone, aside from the non-recourse debt, has provided approximately €999 million to the offshore industry, such as its loan facilities for Baltic II wind farm, Sandbank and West of Duddon Sands. Likewise, the EIB has been an active creditor in financing the OFTO activity in the UK.

Pension funds are emerging as debt providers in the offshore industry, with Danish pension funds taking the lead and acting as trend setters with the support of EKF. For the Gemini project, PKA provided €120 million in mezzanine debt facility. The Green Investment Bank, unlike the previous year, limited its offshore activity to equity financing, as part of their wider strategy to assist the UK offshore wind industry recycle its capital.

## Equity finance

On the equity side, activity has been strong especially in the pre-construction stage. Announced and completed divestment stakes reached 1.58 GW in 2014. Part of them are strategic, whereas others are due to developers' financial challenges and budget constraints.

Notable equity transactions also marked the entrance of new actors in the European offshore wind. Given the current trend of increasing project size, cost, distance from the shore and hence risk, partnerships have proven to be key to market success, evidenced also by the high level of divestments.

1.58 GW of divestments were announced by Power Producers in 2014.

Almost 73% of all divestments happened at pre-construction stage. This was due to the acquisition of Veja Mate windfarm by Laidlaw Capital Group and Nordsee by Northland Power.

FIG. 28: ACQUISITION AND STAGE OF PROJECTS

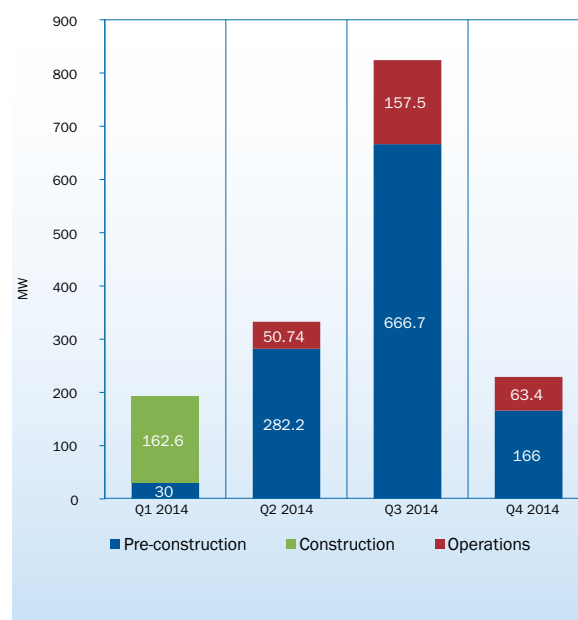
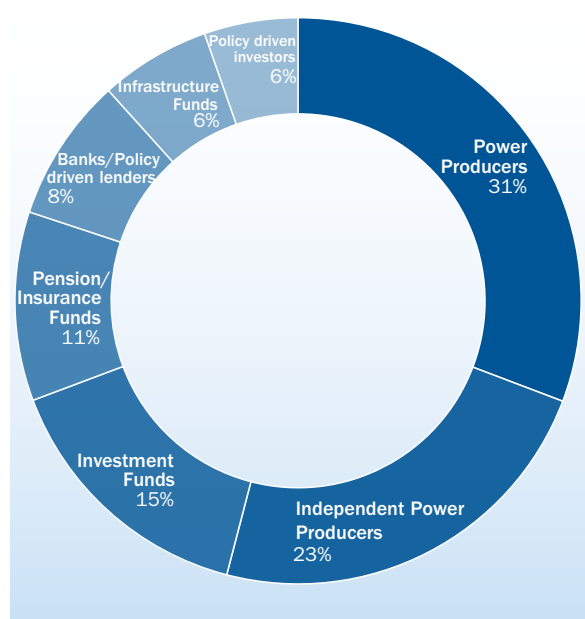


FIG. 29: MARKET SEGMENTATION OF MAJOR EQUITY INVESTORS IN 2014

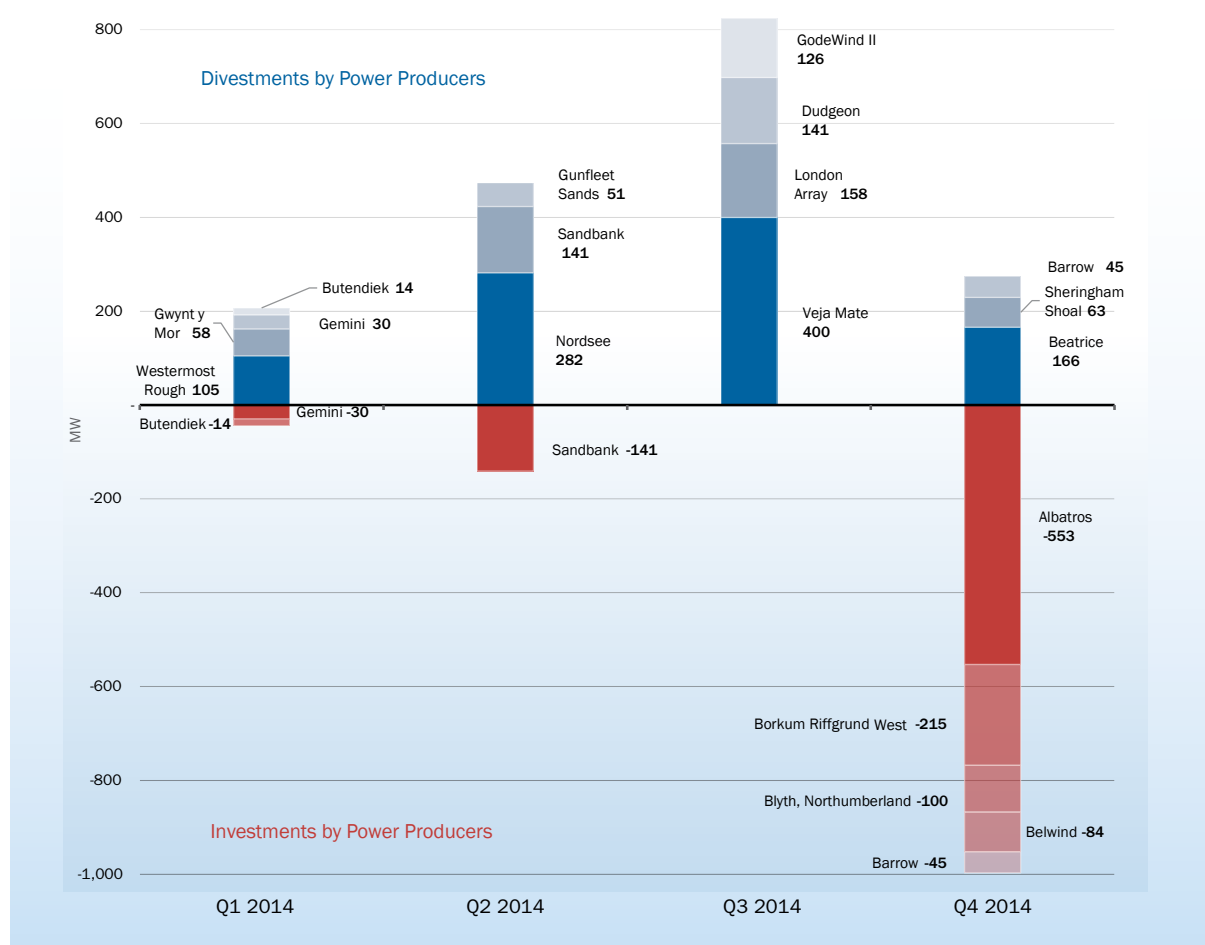
2014 was strong on the sell side. However, power producers remained the major equity investors in 2014.



#### Equity finance - Transaction highlights

- UK Green Investment Bank furthered its commitment to the offshore wind industry by purchasing a 25% (52,5 MW) stake in Westernmost Rough (alongside Marubeni Corporation who also took a 25% stake) and a 10% (58 MW) stake in Gwynt y Môr windfarm from RWE Innogy. Both projects are in the construction stage. Later in 2014, GIB purchased a 20% (63 MW) stake from Statkraft and Statoil in the operating Sheringham Shoal wind farm;
- Northland Power purchased 5% (30 MW) stake from Typhoon Offshore, bringing to 60% its total ownership in Gemini project. Further, the Canadian power producer purchased 85% of Nordsee One from RWE Innogy;
- Japanese actors have continued to be active in the offshore wind industry, both in the credit and equity markets, where they have acquired a number of assets. Development Bank of Japan purchased a 24.95% (51 MW) equity stake in Gunfleet Sands;
- Laidlaw Capital Group purchased 100% (400 MW) in Veja Mate windfarm from developer BARD;
- La Caisse de Dépôt et Placement du Québec acquired 50% (158 MW) from developer DONG Energy's share in London Array wind farm, bringing the share of DONG Energy to 25%;
- Masdar bought a 35% (141 MW) stake in UK offshore project Dudgeon, as a commitment of the United Arab Emirates to balancing the global energy mix;
- Danish institutional investors have remained active in 2014 as well. A consortium of Danish pension funds, led by PKA, acquired 50% (126 MW) of Gode Wind II project. Copenhagen Infrastructure Partners purchased a 25% stake (166 MW) in Beatrice windfarm;
- Stadtwerke Munchen acquired a 49% (141 MW) stake in Sandbank, while the Swiss EWZ acquired 14 MW (4.9% stake) in Butendiek;
- The German wind farms Albatros (553 MW) and Borkum Riffgrund West 2 (215 MW), purchased respectively by EnBW and DONG Energy;
- Aspiravi acquired 39% (84 MW) stake in Belwind.
- In the UK, EDF acquired 100% of Blyth Northumberland (100 MW) windfarm, while DONG Energy buys from Centrica the remaining 50% stake (45 MW) in Barrow.

FIG. 30: EQUITY FINANCE - TRANSACTION HIGHLIGHTS IN 2014 BY QUARTER



## Offshore Transmission Owners (OFTO): transaction highlights

UK OFTOs are rapidly evolving as a strategic asset class. They also play an important role in meeting the UK's renewable targets for 2020. Two large transactions reached financial close in 2014: Lincs (€370 million with a debt-to-equity structure of 60:40) and Thanet (€197 million, €185 million of which to be financed with debt).

The third tender round was launched in 2014 for the transmission lines of Westernmost Rough and Humber Gateway wind farms. The estimated value of these assets is £400 million (€480 million). The Office of Gas and Electricity Markets (OFGEM) reports that the section so far has attracted £1.4 billion (€1.68 million), with another £1.5 billion (€1.8 million) in the tender process.

## Outlook for 2015

The financial markets in 2014 continued to support the offshore wind sector across a variety of instruments, and a broadening investor and creditor base. The year saw more Japanese actors such as banks, trading houses and semi-public institutions, entering the European offshore industry.

The record level of non-recourse debt that was raised in 2014 indicates that financial markets are willing to support well-structured projects. Furthermore, equity transactions in 2014 indicate that partnerships are likely to be key to financing offshore wind opportunities.

The high level of activity in Northern Europe might result in increased competition for project funding. It nonetheless reflects that certainty and stability of the support regimes remain key elements for a good investment climate.

A number of transactions are expected to reach a final investment decision in 2015, such as the debt and equity funding of Veja Mate, Nobelwind project (formerly known as Belwind II), Galloper, Nordsee One, and the second EIB loan for Baltic II.

## Annual investment in offshore wind by investor type

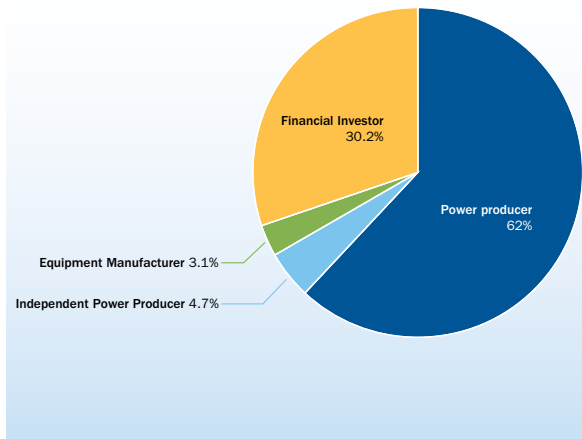


FIG. 31: INVESTMENT IN OFFSHORE WIND FARMS BY INVESTOR TYPE IN 2014 ANNUAL ONLINE CAPACITY

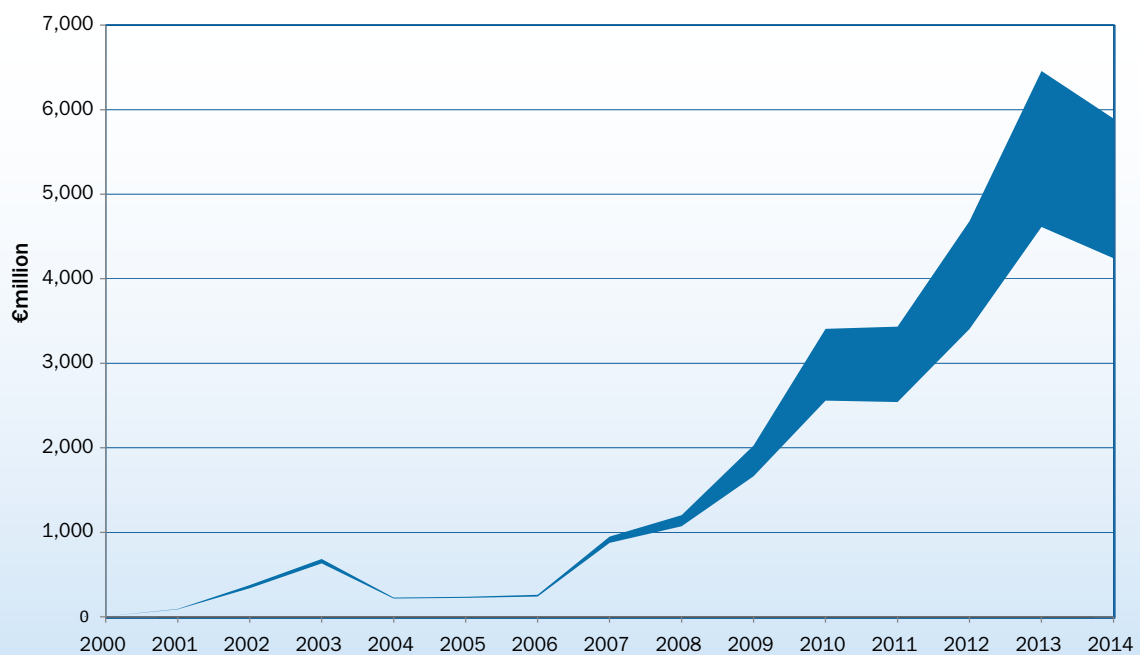
In 2014, 62% of annual online capacity was financed by power producers. The financial community was also active in financing (30.2% of annual online capacity), followed by independent power producers (4.7% of total capacity in 2014), and equipment manufacturers (3.1% of annual online capacity).

## Annual investment in offshore wind farms

In 2014, investment in offshore wind farms ranged from €4.2billion to €5.9billion. A range is given as average project costs can vary significantly depending on the size and location of the wind farms.

Taking into account average installation costs per MW, annual investments in offshore wind farms in Europe since 2000 are presented in figure 32 below.

FIG. 32: RANGE OF ANNUAL INVESTMENTS IN OFFSHORE WIND FARMS





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